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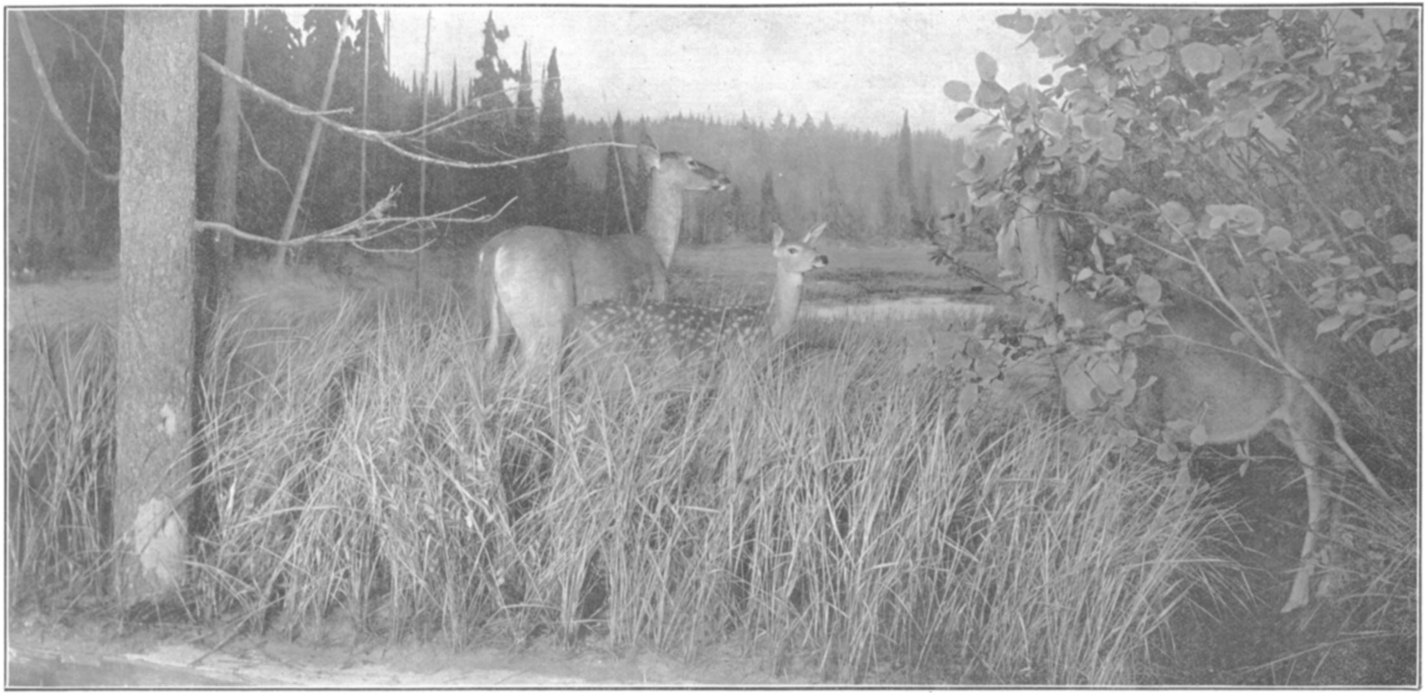

A Habitat Group of Virginia Deer installed in the American Museum of Natural History, by Hobart Nichols, A.N.A., showing the beautiful results now obtained in museum exhibits.

THE PROGRESS OF SCIENCE

THE ARMORED DINOSAUR

RECENTLY there has been placed on exhibition in the United States National Museum, at Washington, the mounted skeleton of an armored dinosaur on which science has bestowed the name *Stegosaurus*. The skeleton as exhibited (see Fig. 7, reproduced here from a photograph of the specimen) measures 14 feet 9 inches long and stands about 8 feet high from the ground to the top of the highest plate. The bones of this specimen were discovered in southeastern Wyoming, a region long famous for the many and well-preserved fossil specimens found there. Although collected more than thirty years ago, it is now exhibited to the public for the first time.

The Stegosaurs were by reason of their large size and ornate bony skin structures the more striking and characteristic of the large reptilia that inhabited the Northern Hemisphere in the long-past ages. It should be stated, however, that this family is not confined exclusively to North America, for specimens have been found in England, France and German East Africa that are but little unlike the American representatives.

At this time the origin of the family is not known, though it is now generally believed that they were descended from a bipedal ancestry and that increasing bulk and development of the dermal armor caused them to lose celerity of movement, thus becoming sluggish, slow-moving creatures of low mentality. By measurement of the brain cavity in the skull of *Stegosaurus* it is found that the brain displaces but 56 cubic centimeters of water, with an estimated weight of about 2½ ounces. This small organ directed the movements of a creature estimated to weigh several tons, whereas the average normal human brain has a capacity of 900 cubic centimeters in a

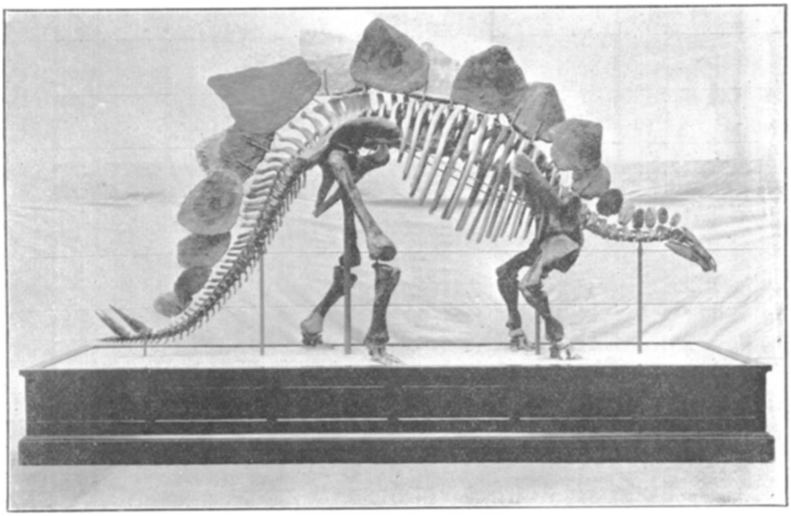

FIG. 1. THE MOUNTED SKELETON OF *Stegosaurus*.

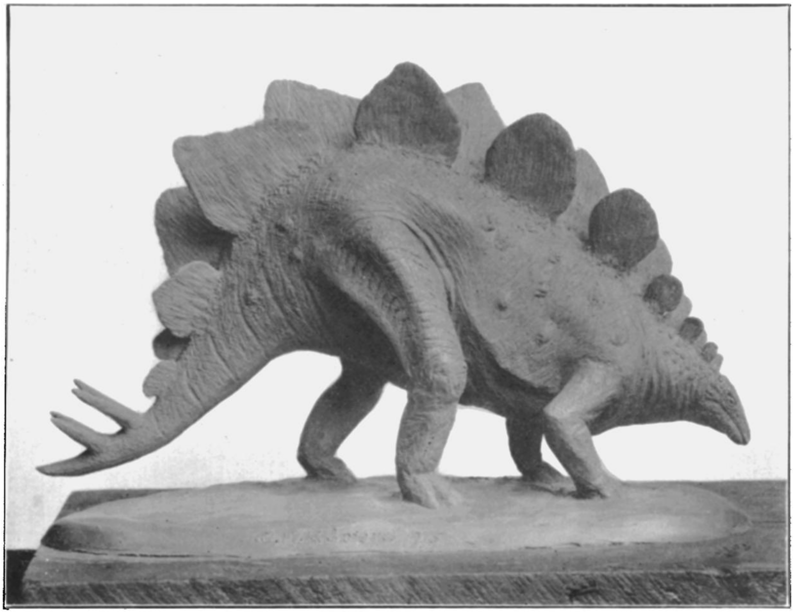

FIG. 2. RESTORATION OF *Stegosaurus*.

creature weighing from 130 to 150 pounds.

The most remarkable feature of the nervous system of this great brute, however, is the enormous enlargement of the spinal cord in the sacral region, which has a mass of more than 20 times that of the puny brain. At best the intelligence of this animal was of the lowest order, hardly more than sufficient to direct the mere mechanical functions of life. Whereas the great horned dinosaurs with skulls from 7 to 9 feet long were the largest-headed land animals the world has ever known, the Stegosaurs are the smallest-headed when the great bulk of the body is taken into consideration. The jaws are provided with a dentition made up of teeth so small and weak as to be always a source of wonder and conjecture as to the real character of their feeding habits. It would at least appear to indicate that their food consisted of the most succulent of terrestrial plants.

The structure of the large, broad feet suggests they were land haunting, doubtless of low, swampy regions rather than the upland, and such an environment would be most suitable for furnishing the soft plant life necessary for their sustenance.

In addition to the small head, the great difference in the proportions of the fore and hind legs, the one most striking external feature of *Stegosaurus* is the unusual development of the skin armor, consisting as it does of two parallel rows of erect alternating bony plates extending from back of the skull on either side of the midline of the back to the end of the tail, the tail being armed near the tip with two pairs of bony spikes or spines. There are also a considerable number of small rounded bony ossicles that in life were held in the skin and probably formed a mail-like protection to the head and neck. The primary purpose of this armor must have been for defense, protective to the extent of giving the animal a most formidable appearance rather than actually useful as defensive instruments.

While the fossil remains of these animals are not uncommon in our museums, they consist for the most part of the scattered and disarticulated bones of the skeleton, the present specimen being the only mounted skeleton of this animal on exhibition at this time.

In Fig. 2 is shown a model restoration of *Stegosaurus* prepared by the writer and which portrays his conception of the life appearance of this animal. In this restoration is incorporated all the latest evidence relating to its external appearance, and it is thought to give a fairly accurate picture of the living animal. The recent discoveries of skin impressions with the fossil remains of other dinosaurian specimens makes it not unreasonable to expect that *Stegosaurus* had a scale-like integumentary covering, instead of the smooth elephant-like skin as here depicted. In the light of these recent discoveries we may yet hope to have still more definite knowledge as to its true nature.

CHARLES W. GILMORE

THE SULPHUR SITUATION IN THE UNITED STATES

A PUBLICATION of the U. S. National Museum under the title " Sulphur: An Example of Industrial Independence," by Joseph E. Pogue of the Division of Mineral Technology, presents in a simple and non-technical manner the striking aspects of one of the most interesting mineral industries in our country to-day. A feature of value is a series of half-tone plates, made not only from actual photographs of mining operations, but also from several views of a miniature model-reproduction of a typical sulphur mine, with the underground disposition of the sulphur exposed to sight, so reproduced as to give the appearance of bird's-eye or aeroplane view of both occurrence and mining.

At the outbreak of the war in 1914, the United States was producing each year about 350,000 tons of sulphur, valued at a little over $6,000,000. This quantity was sufficient to supply not only the needs of this country, but contributed about 100,000 tons to European markets. With the development of war activities, however, the production has increased to meet the growing needs of munition makers, while the exports have decreased as a result of disturbed trade conditions and the need for building up reserves of this essential material at home.

It is a singular fact that the chief raw materials of explosive manufacture are localized in a remarkable manner, and sulphur is no exception to this rule. In the United States practically the entire supply comes from a number of deposits in Louisiana and Texas near the Gulf Coast. These deposits are similar in nature and consist of a series of beds and lenses of pure sulphur at a depth of several hundred feet from the surface.

The discovery of the occurrence of sulphur of this type was made as far back as 1865, in connection with a well drilled for oil. All attempts at mining the sulphur failed, however, until some fifteen years ago, when a highly ingenious method was devised for winning this substance without recourse to the ordinary costly underground operations usually prosecuted in mining. This process makes use of the fact that sulphur melts at a relatively low temperature. By drilling a well through the overlying rock until the sulphur bed is tapped and then sinking a series of interpenetrating pipes through which superheated steam is forced, the sulphur is melted and forced to the surface as a hot liquid, where it is piped